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MAY 2000

CONSULTATION BETWEEN NMFS AND NON-GOVERNMENT ENVIRONMENTAL ORGANIZATIONS REGARDING A POTENTIAL CHASE/RECAPTURE EXPERIMENT: MEETING REPORT

by

Joyce Sisson and Elizabeth Edwards

ADMINISTRATIVE REPORT LJ-00-04

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ADMINISTRATIVE REPORT LJ-00-04

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CONSULTATION BETWEEN NMFS AND NON-GOVERNMENT ENVIRONMENTAL ORGANIZATIONS REGARDING A POTENTIAL CHASE/RECAPTURE EXPERIMENT: MEETING REPORT

8 AM - 12 PM
September 9, 1999
Radisson Hotel
La Jolla, CA

Convened by:

Dr. Stephen B. Reilly, Program Director
International Dolphin Conservation Program Act Research Program
Southwest Fisheries Science Center
National Marine Fisheries Service, NOAA
La Jolla, CA

Abstract

On September 9, 1999 a meeting was held in La Jolla, California to discuss with interested persons representing non-government environmental organizations (NGOs), concerns regarding a proposed chase-recapture experiment involving dolphins in the eastern tropical Pacific Ocean (ETP). The experiment has been mandated by the International Dolphin Conservation Program Act (IDCPA). The meeting provided the National Marine Fisheries Service (NMFS) with an opportunity to discuss with these groups various concerns that have been raised about the proposed experiment by both NMFS and several NGO groups. The concerns involve scientific, political, logistical, and ethical aspects of the experiment.

Given these concerns, NMFS is reconsidering research priorities to answer the mandates of the IDCPA, and is currently focusing on analysis of data either in NMFS' possession or collectable under NMFS control. Further refinement of these alternative analyses is anticipated, through discussions with various interested groups, agencies, and scientists.

This report summarizes the background leading to the research mandates in the IDCPA, the NMFS proposed chase/recapture experiment and alternatives proposed by the Animal Welfare Institute and Earth Island Institute, concerns about those proposed experiments, and current alternative research being pursued by NMFS.

Meeting Structure and Participants

The meeting was chaired by Stephen B. Reilly, Director of the International Dolphin Conservation Program Act Research Program. A list of participants and their affiliations are attached in Appendix A. Two background documents formed the basis for most of the discussions (Appendix B). One discussed the results of a 1997 workshop on potential research to detect stress

in dolphins that are involved in the yellowfin tuna purse seine fishery (Curry and Edwards, 1998), and the other presented a critique of the research plan as well as an alternative research proposal (White 1999). This report presents a brief summary of the discussions during the meeting with comments and recommendations focused on the scientific aspects of the research projects.

Introduction and Background

In an effort to reduce dolphin mortality in the ETP tuna purse-seine fishery, an agreement called the Declaration of Panama was negotiated by the United States and eleven other fishing nations in 1995. The agreement imposes a total mortality limit of 5,000 dolphins per year and intends that all countries will take steps to eliminate mortality entirely. The International Dolphin Conservation Program Act (IDCPA; U.S. Public Law 105-42), a 1997 amendment to the Marine Mammal Protection Act, was created to give effect to the Declaration of Panama by allowing under certain specific circumstances, the importation of currently-embargoed yellowfin tuna into the United States. The law also includes provisions that could allow tuna caught by the intentional encirclement of dolphins with a purse-seine net in the ETP to be declared "dolphin safe" if no dolphins are observed to be killed or seriously injured in that set. Implementation of these provisions are contingent upon preliminary and then final findings of the Secretary of Commerce that depleted dolphin stocks are not significantly adversely effected by fishing operations.

While recent activities within the ETP tuna purse-seine fishery have reduced observed mortality of dolphins to very low levels, there continues to be concern that the fishing methods used ahave caused and are continuing to cause stress to the dolphins involved and that such stress may be having a significant adverse impact on population recovery through reduction of reproduction and/or survival. As a result, the IDCPA requires that research consisting of population abundance surveys and several "stress studies" be conducted by the National Marine Fisheries Service (NMFS) to determine whether the "intentional deployment on, or encirclement of, dolphins by purse-seine nets is having a significant adverse impact on any depleted dolphin stock." Among the stress studies required by the IDCPA is a repeated chase-recapture experiment.

This IDCPA requirement for "an experiment involving the repeated chase and capturing of dolphins by means of intentional encirclement" likely arose from a recommendation made by participants of a workshop held in July 1997, one month prior to the passage of the law in August 1997. The workshop was held to consider a much more limited question, (i.e., what sort of research might be practically possible in attempting to determine whether fishing methods used in the eastern tropical Pacific Ocean (ETP) tuna purse-seine fishery may cause physiological stress to the dolphin species involved). Invited participants to that workshop included academic scientists specializing in studies of stress in aquatic and/or terrestrial mammals, as well as government agency (NMFS and IATTC) scientists interested in determining whether purse-seine fishing methods were causing physiological stress to dolphins in the ETP. The government scientists familiarized the academic scientists with the characteristics of the dolphins, fishing methods, and physical environment of the ETP, then asked the academics to recommend experiments/studies that could practically be conducted to shed light on the stress question with regard to ETP dolphins.

After some discussion, the workshop participants recommended two basic approaches: 1) collecting samples immediately post-mortem from animals killed by the fishery (a necropsy

program), and 2) collecting a time series of blood samples from repeatedly chased, captured, and released dolphins in order to follow the time course of various stress markers in the blood.

Because the IDCPA was passed so soon after the workshop was completed, and incorporated the primary recommendations from the workshop, the proposed research projects did not have the benefit of the extensive discussion and review that is usually part of the development process for major undertakings such as these. Because of this and because events subsequent to passage of the law, in particular problems with implementing the necropsy program, have raised concerns about future cooperative efforts, NMFS chose to review the proposed chase/recapture experiment more fully before proceeding with detailed planning.

Two areas were of particular concern. First, it was not clear that the experiment as proposed at the workshop in 1997 would provide the type of information needed, given the law's wording which indicates a need for estimating population-level rather than individual-level effects. The population-level emphasis is problematic because the number of dolphins that can practically be sampled repeatedly will be very small (3-5 animals). This is very likely too few animals to be able to determine whether the sampled animals are representative of the entire population. Second, NMFS wanted to address concerns about the potential danger that the experiment may pose to the individual dolphins involved.

Therefore, the purpose of this meeting between NMFS scientists and environmental groups involved or interested in the issue was to invite discussion about the stress research program as proposed to date in order to re-evaluate the potential benefits of the data that might be gathered compared to the potential risks to animals and the necessarily limited extent of the data that it will be possible to collect given the practical constraints of research on dolphins *in situ* in the ETP. This was necessary because NMFS must ultimately determine whether the time and expense that would be involved in conducting the chase-recapture experiments proposed at the 1997 workshop are warranted given the limited data that may be collected and the potential harm that might occur to the dolphins involved.

Summary of NMFS Proposed Chase-Recapture Experiment

The primary objective of the chase-recapture experiment is to determine whether dolphin-fishing in the ETP causes physiological stress to the dolphins involved. As designed in the planning workshop held in July 1997 (Curry and Edwards, 1998), the chase-recapture experiment is intended to provide physiological samples from live dolphins to complement the necropsy program, which will provide tissue and morphological samples from dolphins killed by the fishery. The chase-recapture samples are intended to provide information about dynamic changes in physiological systems affected by chase, capture and release.

If successful, the samples to be collected during the chase-recapture experiment (blood sampled from flukes) would provide repeated measures of stress indicators over a time course that would include multiple sets (likely 3-4) for single animals over a period of several days to weeks. The objective is to measure the time course of responses of stress-related blood parameters in individual animals and to evaluate the potential for recovery between sets.

The point of the July 1997 workshop was to begin to consider what actually could be measured in a practical sense in the ETP to determine whether physiological effects of fishery-related stress are observable in individual dolphins. In a normal research planning process a much more intense review of the proposed research and proposed results would have been conducted but this did not happen prior to the proposal's inclusion into the IDCPA.

The proposed research protocol was designed generally to follow earlier activities conducted jointly by the Inter-American Tropical Tuna Commission (IATTC) and NMFS with the main goal of the experiment to obtain samples from living animals throughout a regime of stresses. Two vessels would be used, a purse seiner to capture dolphins and a research vessel for support, specimen storage and analyses.

Because the proposed experiment would be both expensive and complicated, NMFS examined existing data to pinpoint the best possible time and area in order to maximize the probability of catching and recapturing dolphin schools. This decision was based on a review of the oceanic Beaufort state records (i.e., when and where is it the calmest). The conclusion was that February and March are the calmest times in the dolphin fishing area and the highest abundances are found relatively inshore off the coast of Mexico and South America. The scientists involved would include NMFS and IATTC as well as academics with experience of measuring physiological stress in living animals. Because it is a stress study, we wanted to collect samples and minimize disturbance as a result of handling. Physiologists at the July 1997 meeting indicated that a single 20 ml blood sample would contain a valuable amount of information that could be collected quickly and relatively non-invasively (10 minutes to sample and tag). Tagged individuals would be released, left at liberty 2-4 days, recaptured, re-sampled, re-released, recaptured and re-sampled again. The idea was to look at individual animals over a two week period and see what kind of changes in blood parameters occur over time.

Although the experiment was designed in cooperation between individuals familiar with working conditions related to tuna purse-seine operations in the ETP and individuals experienced in measuring stress in live marine mammals, NMFS now feels that the experiment as proposed may not be the best use of resources to address the mandates of the IDCPA.

Alternative Proposal from Animal Welfare Institute

The Animal Welfare Institute (AWI) provided a critique of NMFS' proposed chase/recapture experiment and invited discussion of a proposed alternative project. Their primary concern with respect to NMFS' proposed chase-recapture experiment focused on the intentional stressing of dolphins in a simulated fishing exercise which was regarded to be of little scientific benefit. The Animal Welfare Institute's proposed alternative would eliminate elements of the chase/recapture study that were viewed as unnecessarily invasive and would focus instead on stress directly related to fishing activities. AWI's proposal would begin with a working definition of "significant adverse impacts," conduct a thorough study of the logbooks and observer data records, and conduct a field experiment focusing on behavioral responses to fishing as well as pathological responses in the blood.

Three additional alternatives were proposed by Dr. Al Myrick. First, "study and assessment of indicator hormones in dolphin adrenal gland samples currently in the NMFS collection," second "study and assessment of potential changes in ETP dolphin reproduction using dolphin reproductive tract samples in the NMFS collection," and third "study of cow/calf ratios using the existing database." The first alternative will not be pursued because the collection methods are not sufficiently documented to be able to rule out strong potential artifacts in the samples. The second alternative has already been investigated by Dr. Susan Chivers at the Southwest Fisheries Science Center and has been found to be unproductive because the existing data extend only to 1990 so that recent changes cannot be assessed. Analyses of earlier data have produced only ambiguous results. The third alternative is being pursued as part of a large study evaluating the potential for separation of cow-calf pairs during the chase/encirclement procedure.

Alternative Proposal from Earth Island Institute

Earth Island Institute (EII) invited discussion of another proposed alternative project, in which a second vessel would monitor the backdown channel during dolphin release, thus potentially providing a means of confirming and/or checking data reported by the scientific observer as well as potentially a means of monitoring survival of released dolphins.

NMFS Chase/Recapture Experiment and Proposed Alternatives: Limiting Considerations

Discussion among meeting participants identified four general areas of concern about the NMFS' proposed experiments: scientific, political, logistical, and ethical concerns. The majority of these concerns also applied to the AWI and EII alternative proposals, as discussed below.

Scientific concerns included probable paucity of data, lack of controls, and lack of comparative data from the proposed necropsy study. The paucity of data is of great concern given the IDCPA's focus on determining population level effects. While it is likely that data could be collected from four or five individual dolphins, it is not likely that this small sample would provide a reasonably representative sample of the population as a whole in terms of sex and age classes, nor would it be possible to determine during a 2-3 week experiment within a limited area whether significant events might be occurring on longer time and/or larger space scales, (e.g., seasonal or locational effects).

In addition, the experiment would suffer from the lack of two levels of unobtainable controls. First, it is not possible to collect comparable data from completely unstressed dolphins (i.e., dolphins affected neither by the fishery nor by handling effects). Second, it is not possible to collect comparable data from dolphins unstressed by handling, even if it were possible to collect data from dolphins not affected by fishing activity. The experiment would also be compromised by the unexpected lack of data from the proposed necropsy program. These necropsy data were expected to provide important comparisons and insights into the data to collected during the chase/recapture experiment. Despite best efforts by NMFS, however, it does not appear that many–if any–of these data are going to become available in time to contribute to the final Finding by the Secretary.

Political concerns involve the likelihood–based on recent and past experience–of extensive delays in obtaining required permits as well as the probability of delays in obtaining an appropriate purse-seiner for the experiment, given that neither the research area nor the required seiner are available through U.S. resources. While all parties continue to express interest in cooperative research projects, the realized pace of progress has been much slower than needed for success in these projects.

Logistical concerns focus on the extremely expensive and time-consuming nature of the proposed experiment, given the substantial risk of collecting too few data to be useful in satisfying the dictates of the IDCPA.

Ethical concerns focus on the problem of causing additional stress with potentially harmful or lethal results to individual dolphins during the chase/recapture process.

While the alternative experiment proposed by the Animal Welfare Institute would potentially cause less stress and risk to individual dolphins, the logistical problems of locating numerous extra personnel on numerous fishing vessels are significantly greater than those associated with NMFS' proposal, without relieving any of the other scientific, political, or ethical concerns outlined above.

NMFS Alternative Research Plans

Taking the above concerns into consideration, NMFS is pursuing alternative approaches to address the mandates of the IDCPA in terms of determining whether chase and encirclement is having a significant adverse impact on ETP dolphins populations.

Given the problems that have been occurring with projects requiring international cooperation or work with live animals, NMFS has been concentrating on the third source of data identified in the IDCPA (i.e., historical data already collected and in NMFS' possession), as well as other sources of more recent data whose collection and analysis is under NMFS' control.

Although some but not all of these alternative studies may suffer from some of the same limitations as the proposals discussed above, particularly with respect to extrapolating data from a few or some animals to a population level effect, it is hoped that they may provide reasonable answers at a lower cost and without the problems associated with ethics or politics.

NMFS is currently engaged in two activities utilizing data under NMFS control. First is an analysis of historical data, in which NMFS is comparing the genetic relatedness of cows and calves in sets in which all of the animals that were killed were examined. NMFS is trying to detemine whether cows and calves get irreversibly separated in the chase operation. It's a type of stress that specifically results from chase and capture. If in fact separation of cows and calves is pervasive and demonstrated by the data, it could explain much of the data and some of the conclusions from the preliminary finding, in which the populations do not appear to be recovering as expected. NMFS has examined over 1,200 sets to date from which all killed dolphins were samples, which includes all the available historical data archived at the SWC. Preliminary results indicate that a problem is likely. If so, this previously unrecognized calf mortality contributes an additional source of mortality that has not been accounted for in mortality estimates in the past.

To date, the information presented has shown that the populations have not recovered, but it has been not been shown that the fishery is responsible. This study has the potential to be the first to demonstrate a direct mechanism linking fishery activities and delayed population recovery.

NMFS' second alternative research project focuses on the feasibility of using molecular means to observe the effects of stress. Skin samples are available from animals biopsied from areas that are heavily fished as well as areas that are not heavily fished or are not fished at all. The samples from areas of low or no fishing effort provide presumably unstressed control samples with which the presumably stressed samples from the heavily fished areas can be compared.

Three different indices of stress are under investigation: (1) changes in composition of skin microflora (e.g. fungus) which are known to occur in response to stress, (2) production of unique extra-nuclear DNA–also known to occur in response to cellular stress, and (3) increases of messenger RNA of various receptors indicative of neuroimmunological stress.

The technology and techniques are sufficiently well developed that NMFS will be able to look in a general way at the animals both inside and outside historical fishery areas. This study suffers from the one problem in common with other proposed research (i.e., showing a population effect through an indicator of stress in individuals). However, if the study does show a pervasive pattern of stress in the fishery area compared to little evidence of stress in non-fished areas, it will be difficult to discount the fishery as a strong contributing factor to any observed difference.

Other Suggested Research Projects

Other research projects suggested included examining observer records for differences in dolphin behavior during chase and encirclement, either over time within the fishery or in highly versus lightly fished areas, and examining existing morphological samples for differences related to fishing intensity.

NMFS will be looking further into both of these potential avenues of research, as well as revisiting the catalogue of existing samples to determine if any additional studies might be warranted.

Conclusion

The consensus of the participants at the discussion workshop was that NMFS' chase/recapture experiment, given the logistical and ethical problems posed, was not likely to provide sufficient data to warrant the expense and risk to dolphins involved. NMFS' alternative research projects were thought to be promising and additional research avenues were suggested to complement those ongoing.

NMFS will continue to pursue the alternative projects in addition to investigating the potential of the additional research avenues while reconsidering whether to proceed with the chase/recapture experiment.

APPENDIX A

LIST OF PARTICIPANTS

NMFS:

Dr. Stephen Reilly
Dr. Robert Brownell
Dr. Elizabeth Edwards
Ms. Joyce Sisson
Ms. J. Allison Routt

Non-Governmental Organizations:

Animal Welfare Institute
Dr. Al Myrick
Mr. Ben White
Earth Island Institute
Ms. Ariela Freed
Mr. Angel Herrera
Mr. Mark Palmer
Humane Society of the United States
Dr. Naomi Rose

Non-Governmental Organizations (Invited but not in attendance)

American Cetacean Society
Ms. Katy Penland
Center for Marine Conservation
Ms. Nina Young
Defenders Of Wildlife
Ms. Rina Rodrequez
Whale and Dolphin Conservation Society
Ms. Kathleen O'Connell

APPENDIX B

BACKGROUND DOCUMENTS

Curry, B.E. and E. F. Edwards. 1998. Investigation of the potential influence of fishery-induced stress on dolphins in the eastern tropical Pacific Ocean: Research Planning. US DOC NOAA Technical Memorandum NMFS, NOAA-TM-NMFS-SWFSC-254.

White, B. 1999. Proposed dolphin research: A critique of the flawed National Marine Fisheries Service Proposal. Available from the Animal Welfare Institute, P.O. Box 3650 Washington, D.C. 20007.

APPENDIX C

COMMENTS FROM INVITED NGO GROUPS

Participating NGO groups requested that the meeting report express the groups' concerns about the current lack of a definition for "significant adverse impacts" and about the need for applying the Precautionary Principle and requirements of the MMPA to the Secretary's final finding on "significant adverse impact." The text of the report also contains some revisions suggested by the attending NGO groups upon reading of the draft report. Because some of the comments provided were more general than appropriate for inclusion of this report, we include as an attachment the full text of the comments provided by those groups (letter to Reilly from Earth Island Institute, November 4, 1999; letter to Reilly from Center for Marine Conservation, January 12, 2000).

Department of Commerce
National Marine Fisheries Service
DEC 1 1999
Southwest Fisheries Science Center
La Jolla, California

Dr. Stephen B. Reilly
Research Director
International Dolphin Conservation Program
National Marine Fisheries Service
Southwest Fisheries Science Center
P.O. Box 271
La Jolla, CA 92038-0271

November 4, 1999

RE: Comments on Draft Chase/Recapture Discussion Meeting: Meeting Report

Dear Dr. Reilly:

The following conservation, environmental and animal welfare organizations endorse the contents of this letter:

International Marine Mammal Project of Earth Island Institute, Humane Society of the U.S., Animal Welfare Institute, Animal Fund, American Society for the Prevention of Cruelty to Animals, Earthtrust, and Greenpeace Foundation Hawaii.

On behalf of these groups, we would like to provide the following comments on the draft Meeting Report on the Chase/Recapture Discussion:

In presenting these comments, we include by reference previous correspondence sent to the National Marine Fisheries Service and the U.S. Department of Commerce on this subject by Earth Island Institute, Humane Society of the United States, Animal Welfare Institute, and Environmental Solutions International.

To begin with, we feel the Department of Commerce must take several important steps to clarify and revise its interpretation of the International Dolphin Conservation Program Act (IDCP Act, PL 105-42):

1. We again strongly request that the U.S. Department of Commerce define "significant adverse impacts" to dolphin populations and structure its research protocols to adequately address the finding required by the IDCP Act:

300 Broadway, Suite 28
San Francisco, CA 94133
Tel: 415-788-3666
Fax: 415-788-7324

Our organizations have repeatedly requested that the Department of Commerce and the National Marine Fisheries Service (NMFS) define what is meant by "significant adverse impacts" on dolphin populations in the Eastern Tropical Pacific (ETP).

Further, we have requested that the scientific study protocols be developed to address the relevant question raised by the finding mandated by the IDCP Act: Does chasing and netting of dolphins in the process of tuna fishing in the ETP cause "significant adverse impacts" on depleted dolphin populations?

The Secretary of Commerce's April 1999 finding underscores our concerns. The Secretary determined that, since the NMFS could not "prove" that the tuna fishery was responsible for a lack of recovery of depleted dolphin populations, "no significant adverse impacts" was the only conclusion he could reach. At no time prior to his finding were our organizations apprised that the Secretary interpreted the IDCP Act to "require" absolute proof. Indeed, we believe that this interpretation is unsupported in the law and in science, and is patently unreasonable. In addition, we believe that the best available scientific evidence points to the fishery as the most logical source of harm to depleted dolphin populations, particularly since no alternative cause is implicated. As you know, these matters are now the subject of a lawsuit against the Commerce Secretary and NMFS ("Brower vs Daley"). Our groups are challenging the validity of the finding because we believe the Secretary ignored the best available scientific evidence, including the advice of his own scientists. In light of our position on these and other issues, nothing in this letter shall be construed as an agreement, express or implied, with the Secretary's interpretation of the requirements of the IDCP Act or the Marine Mammal Protection Act (MMPA) relating to the 1999 and 2002 findings.

In sum, it is imperative that the Commerce Secretary and NMFS immediately (1) define what constitutes "significant adverse impacts," as part of a standard rulemaking, and (2) draft specific study protocols that address all aspects of the Secretary's 2002 finding, including causation and burden of proof, and that are consistent with the law and the limits of science. This should avoid the unnecessary and questionable raising of new issues by the Secretary at the time of the finding that have not been studied by NMFS.

The NMFS chase/recapture study meeting report should reference our organizations' concerns about the lack of a definition for "significant adverse impacts," which we strongly expressed during our meeting.

2. The Secretary should apply the Precautionary Principle in his finding regarding "significant adverse impacts" to protect dolphins in the alleged absence of definitive

research rather than risk non-recovery of already depleted dolphin populations:

Again, as has been emphasized by previous correspondence from our groups, the Secretary of Commerce should not be jeopardizing dolphins by using an alleged absence of definitive research results from NMFS studies to allow and encourage fishing practices involving the chase and netting of dolphins. The Precautionary Principle, as well as the clear mandates of the MMPA, require the Secretary to err on the side of protecting depleted dolphin populations when the best available scientific evidence demonstrates that these populations are not recovering, even in the alleged absence of definitive or complete research.

Associated with this concern are the limits of what science can and cannot do. The Secretary of Commerce should consult closely with the NMFS scientific community over limitations in developing absolute science-based "proof" of cause-and-effect relationships on a population scale in the vast reaches of the Pacific Ocean. These limitations should not prevent a finding that is based on the Precautionary Principle and the express requirements of the MMPA. Indeed, the Precautionary Principle was developed in part to address just these kinds of management dilemmas. Again, the NMFS chase/recapture study meeting report should reflect our organizations' concerns with the need to apply the Precautionary Principle and the requirements of the MMPA to the Secretary's finding on "significant adverse impacts."

3. We express our deep concern that the government of Mexico and other ETP tuna fishing nations have repeatedly thrown up barriers to research on dolphin stress:

The IDCP Act mandates studies on stress in dolphins, including a chase/recapture study. However, none of the stress studies have gone forward, except those under the direct control of NMFS (using existing samples and skin biopsies taken on research cruises), because of a lack of cooperation by the government of Mexico and the flat refusal by other ETP fishing nations to participate in such studies.

This lack of cooperation seriously jeopardizes NMFS's ability to comply with federal law. Insofar as the Secretary of Commerce, in his April 1999 finding, used a lack of research results as an excuse to weaken the "dolphin safe" tuna label, to the benefit of Mexico's and other ETP fishing nations' tuna industries, we strongly question the commitment of the U.S. Department of Commerce to obtain adequate research results and protect dolphins at all. Continued acceptance of this lack of cooperation by the Department of Commerce would represent a serious and fundamental breach in its duty to implement the IDCP Act in good faith. ETP tuna fishing nations that refuse to cooperate with U.S.

researchers should not be rewarded with access to the U.S. market for sale of their tuna.

The NMFS chase/recapture study meeting report should emphasize the strong objections our organizations raised over the lack of cooperation shown by the governments of ETP tuna fishing nations to conduct the Congressionally-required stress research studies. We also urge that the chase/recapture study meeting report explicitly state that authorities in Mexico and in other ETP tuna fishing nations have not fully cooperated with NMFS efforts to move forward with the necropsy study, resulting in a complete lack of any samples for study by NMFS.

In keeping with the concerns expressed above and following discussions of our meeting on the proposed NMFS chase/recapture study protocol, our organizations make the following comments on the NMFS chase/recapture study meeting report:

A chase/recapture study is mandated by Congress, but the NMFS proposed Chase/Recapture Study protocol should be substituted with several alternative stress studies outlined by the NMFS scientists and our organizations:

The IDCP Act mandates that NMFS conduct a chase and recapture study of dolphins in the ETP to measure variable stress levels. However, as noted in the meeting, there are various problems with implementation of the proposed NMFS chase/recapture experiment protocol recognized by our organizations. The lack of cooperation by Mexico and other ETP fishing nations in the first phase study of obtaining necropsy samples of dolphins for measuring stress parameters renders the NMFS chase/recapture study difficult to implement, and cooperation is unlikely in a timely manner. Our organizations have also expressed concerns about the chasing and harassment of dolphins by a dedicated vessel from an ethical standpoint.

We propose that NMFS return to Congress and have the chase/recapture study mandate modified to accommodate the proposed alternative stress studies outlined below. We strongly recommend that NMFS provide to members of Congress a full explanation of the problems encountered, including clarification of the Commerce Secretary's finding mandate, the limitations of science in making absolute determinations, and the lack of cooperation by Mexico and other ETP tuna fishing nations.

Our organizations' support of the NMFS decision not to complete the NMFS proposed chase/recapture study is contingent upon a formal commitment from NMFS to pursue and complete the alternative stress studies noted in the report. We emphasize that we reserve the right to raise the lack of adequate dolphin stress research studies in

the future and the failure of NMFS to meet the mandates of research required by the IDCP Act, should the Secretary of Commerce once again choose to cite a lack of data as an excuse for jeopardizing depleted dolphin populations in the ETP, in his final finding.

Indeed, we do not believe that Mexico's and other ETP tuna fishing nations' refusals to cooperate, and the corresponding lack of data from the NMFS proposed studies, constitute a sufficient legal or moral excuse for the Secretary to determine in 2002 that he has insufficient information upon which to base an affirmative finding of significant adverse impacts. Both NMFS and the Commerce Department remain fully responsible for complying with the research mandates of the law, either by completing the Congressionally-mandated studies or by providing sufficient and competent alternate data from other studies, irrespective of the cooperation of other nations.

That being said, we support the efforts of NMFS to pursue other avenues of researching stress in dolphins, through the application of DNA studies to cow/calf ratios in net sets and through identification of stress indicators in skin samples which can be obtained through existing research cruises. We look forward to sharing the research data from these programs. We strongly feel that NMFS must move forward with these studies in a timely manner and complete them prior to the Secretary's 2002 finding.

To that end, NMFS should develop a formal research proposal with respect to each proposed study disclosing the projected milestones, completion dates, budget, how the alternative stress studies will be designed to meet the requirements of the IDCP Act, and to address the specific concerns of the Secretary of Commerce.

NMFS and the Department of Commerce must also release research results in a timely manner, rather than keep the research results secret (as was done with the NMFS Report to Congress in March 1999) until after the Secretary of Commerce makes his finding. We believe full transparency is appropriate and that the public has a right to view research results by public agencies. We emphasize that such research results are an important part of the public dialog and must be available for public review before a finding is made by the Secretary.

Additional research proposals by Dr. Albert Myrick:

In addition to the alternative stress studies proposed by NMFS, AWI, and Earth Island Institute, we request that NMFS assess several additional studies proposed by Dr. Albert Myrick and discussed at the meeting, as follows:

- Study and assessment of stress indicator hormones in dolphin adrenal gland samples currently in the NMFS collection;

- Study and assessment of potential changes in ETP dolphin reproduction, using dolphin reproductive tract samples in the NMFS collection; and

- Study of cow/calf ratios using the existing database, to quantify how many cows are missing calves, as an adjunct to the more detailed and precise DNA studies. (The recent presentation before the U.S. Marine Mammal Commission suggests that this study has in fact been conducted.)

Should NMFS decide not to pursue these alternative studies, NMFS must be prepared to explain the specific reasons for such a decision.

Specific comments on Draft NMFS Chase/Recapture Study Meeting Report:

In addition to the foregoing, we would like to provide the following specific comments on the draft:

Page 1, Introduction and Background, 1st paragraph, 3rd sentence: Please make the following addition at the end of this sentence (underlined): "The International Dolphin Conservation Program Act....was created to give effect to the Declaration of Panama by allowing the importation of currently-embargoed yellowfin tuna into the United States, subject to certain conditions."

Page 4, 3rd paragraph, second line: We strongly disagree that the observed dolphin mortality has been reduced to "very low levels" in the ETP. We recommend revising "very low levels" to "low levels", as reported ETP dolphin mortality still hovers in the thousands of animals, which is not an insignificant number.

Page 5, 3rd paragraph, and elsewhere: Reference is made to difficulties with "cooperative efforts" in the research on stress in dolphins. It should be specified that the lack of cooperation is with the government of Mexico and other ETP tuna fishing nations, and that our organizations strongly condemned this lack of cooperation during our meeting.

Page 5, 4th paragraph, 2nd sentence: We disagree with the statement that "it was not clear that the experiment as proposed at the workshop in 1997 would provide the type of information needed, given the law's wording and indicating a need for estimating population-level rather than individual-level effects." The IDCP Act does not require this specificity; rather, it requires a finding based on the best available scientific information. We suggest substituting "given the Secretary's

interpretation of the IDCP Act and his indicating a need for..." instead.

Limited sample size: The report notes that the NMFS's proposed chase/recapture research protocol will not address population-level effects crucial to the pending finding by the Secretary of Commerce. It should be specified that the reason the research will not address this issue is due, given time and funding restraints, to the small expected sample size of recaptured dolphins for comparison of blood samples.

Page 7, 5th paragraph, 4th sentence: The report refers to the "unexpected lack of data from the proposed necropsy program," without attributing a cause to the failure of that program. Again, NMFS should make clear in its report that the reason this mandated program has not gone forward is the continued refusal of Mexico and other ETP tuna fishing nations to cooperate in its implementation.

Page 8, 1st paragraph: We disagree with the statement "...given the substantial risk of collecting too few data to be useful in satisfying the dictates of the IDCP Act." We recommend "...given the risk of collecting too few data to be useful in satisfying the IDCP Act as interpreted by the Secretary of Commerce."

Page 8, 4th paragraph: The report notes that proposals by the Animal Welfare Institute cannot be conducted "without relieving any of the other....ethical concerns outlined above." In fact, the AWI proposal does relieve the ethical concerns, as it proposes using dolphins that have already been stressed during fishing operations. We recommend leaving out "ethical" as one of the concerns for this alternative proposal. While we do believe there are limitations on this proposed research because of the lack of cooperation by ETP tuna fishing nations, our organizations feel that the AWI and Earth Island proposals would provide useful data, and the report should reflect this belief.

Page 9, 1st paragraph: The report states that "...but it has not been shown that the fishery is responsible." Our organizations strongly disagree with this statement. In fact, there is substantial evidence that the fishery is responsible, and there is no evidence that suggests other factors or conditions are at work. We would agree to modifying this statement to say: "...but the Secretary of Commerce alleges in his preliminary finding that it has not been shown that the fishery is responsible."

Page 10, Conclusion: We do not agree with the Conclusion as drafted. We suggest the following revisions:

"The consensus of the participants at the discussion workshop was that the Chase/Recapture Experiment protocol, as proposed by NMFS, given the logistical and ethical problems posed, was not

likely to warrant the expense and risk to dolphins involved, provided satisfactory alternate data could be obtained using other methods. NMFS's alternative research projects were thought to be promising, as were several additional research proposals suggested at the meeting. NMFS will continue to pursue the alternative projects and proposals in addition to investigating other research avenues, as possible substitutes for the original Chase/Recapture Experiment proposal."

Sincerely,

David Phillips
Director

Mark J. Palmer
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January 12, 2000

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Southwest Fisheries Center
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[RE: Comments on the Consultation between NMFS and Non-Governmental Organizations Regarding a Potential Chase/Recapture Experiment.]

Dear Dr. Reilly:

The Center for Marine Conservation (CMC) appreciates the opportunity to comment on the Proposed Chase-Recapture Experiment. CMC strongly supports National Marine Fisheries Service (NMFS) undertaking an experiment that will accurately assess the "dynamic changes in the physiological systems of dolphins chased, captured, and released in the eastern tropical Pacific tuna purse seine fishery. It is critical that NMFS undertake these experiments to more fully illuminate the physiological response of these animals under present-day fishing practices. CMC believes that such information cannot be gleaned by retrospective analysis of samples collected, in some cases, more than twenty years ago. NMFS raises several scientific, political, logistical, and ethical concerns in this document. However, none of these concerns are insurmountable. Most of the scientific concerns could be addressed merely by reconvening a group of experts, similar to those assembled to develop the initial research plan. These experts could refine the proposed chase-recapture expert to deal with such concerns as inadequate controls and sample size and applicability to the population as a whole. The political and logistical concerns raised by NMFS requires that both NMFS and the State Department aggressively pursue multilateral discussions with nations whose fleet encircle dolphins to secure the necessary commitment and effectively implement a joint research program. To date, NMFS has failed to develop and effectively pursue a dedicated collaboration among international partners to achieve its research priorities and mandates.

Therefore, CMC strongly urges NMFS to convene an international workshop with scientific experts similar to those that were assembled to develop the initial fishery-induced stress research plan. These experts should take into consideration the concerns that have been raised about the chase-recapture experiment and refine this experiment to address these concerns and to secure international cooperation to ensure the timely completion of this research.

STRESS TERMINOLOGY—THE NEED TO CLARIFY TERMS AND EVALUATE POPULATION LEVEL EFFECTS OF STRESS

Throughout the document and all documents evaluating the physiological stress of dolphins in the ETP tuna fishery, NMFS fails to acknowledge and to separately evaluate the various levels of

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stress. Just like humans, dolphins are adapted to cope with many natural and human-related stressors in their environment.[1] Stress is a body's physiological response to any demand made upon it—a response that can consist of three phases. The first phase, the **Alarm Phase**, is where the animal perceives a threat and the body initiates a rapid physiological response involving the nervous system and the endocrine system. The **Adaptation or Compensation Phase**, the second phase, occurs when, after prolonged exposure to the stressors, the animal adapts to, or compensates for, the altered conditions causing the stress. The third phase, the **Maladaption Phase** occurs when the stress is of sufficient intensity and duration that compensation or adaptation is impossible. In this phase, if the stress is severe or persistent, the body may fail to compensate for the stress and, under the worst circumstances, develop a pathological condition (e.g. illness, infection, immune suppression, death).

For nearly 20 years, U.S. vessels obtained a general permit under the MMPA and its regulations to annually chase and encircle hundreds of thousands of dolphins in yellowfin tuna fishery in the ETP.[2] Dolphins have been chased and encircled in this fishery for more than thirty-five years and have displayed adaptive behaviors in the nets since the 1970s (e.g. fewer displays of panicky dashing about the net).[3] In 1992, the NRC noted that: "no specific information is available concerning the effects of the chase on the biology of dolphins. The chase is likely to result in stress. Some herds have developed strategies to avoid capture; others seem to have habituated to encirclement and seem to have developed behavioral patterns that reduce their risks once in the net."[4] Little has changed in our state of knowledge since that statement was made.

Some have argued that the chase and encirclement of dolphins causes stress of a duration and magnitude—maladaptive phase--that severely impedes dolphin reproduction or even results in post-release dolphin deaths. Available peer-reviewed scientific data provides no indication that mortality occurs after the dolphins are released from tuna purse seine nets. Furthermore, no scientific data demonstrate a preponderance of stress-related diseases or injuries in these dolphin stocks. There has been no evidence of spontaneous abortions, muscle degradation, or stress-related reproductive inhibition in the reproductive tracts examined from dolphins that had died in the tuna fishery."[5]

From NMFS review of the scientific literature there is evidence that the chase, capture, and release of dolphins in the yellowfin tuna fishery is likely to result in an Alarm Phase and an Adaptation Phase of stress. Dolphins experience the Alarm Phase of stress (or "fight or flight"

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[1] Dierauf, L.A. 1990. CRC Handbook of Marine Mammal Medicine: Health, Disease, and Rehabilitation. 295, 296 (1990)..

[2] 50 C.F.R. §216.24 (d)(2)(i)(A)(2)

[3] Pryor, K. and Shallenberger, I.K. 1991. Social structure in spotted dolphins (*Stenella attenuata*) in the tuna purse seine fishery in the eastern tropical Pacific. In Pryor, K. and Norris, K.S. (Eds), Dolphin Societies: Discoveries and Puzzles, Univ. Calif. Press, Berkeley, pp. 161-196.

[4] *See supra* note 15 at 114.

[5] Smith, T.D. (1983) Changes in size of three dolphin (*Stenella spp.*) populations in the eastern tropical Pacific. Fish. Bull. 81, 1-13. See also Chivers, S.J. and DeMaster, D.P. 1994. Evaluation of biological indices for three eastern tropical Pacific dolphin species. J Wildl. Manage. 58(3):470-478.

response) when they hear the distinctive sound of the helicopters, speedboats, or the purse seine vessel. During chase, capture, confinement, and release, the body's reaction to stress in the Adaptation Phase is individual, but may be influenced by the dolphins' past experience in the fishery. *Nevertheless, the best available published scientific literature does not clearly indicate that the stress of encirclement results in death after release or is it likely that dolphins experience the Maladaption Phase.*

Notwithstanding all of the available research, this issue merits further scientific investigation and CMC has vigorously supported further investigation into the impact of chase and encirclement on dolphin biology, physiology, and health. This research, which was develop specifically to determine whether dolphins were entering the Maladaption Phase of stress, is vitally important and we strongly recommend that NMFS undertake this research as expeditiously as possible and in accordance with the International Dolphin Conservation Program Act. We will work closely with NMFS to ensure that these studies are fully funded in the appropriation process, are identified as a research priority, and are undertaken and completed with the cooperation of the international tuna purse-seine fleet.

SPECIFIC COMMENTS:

NMFS Concerns About the Chase-Recapture Experiment.

NMFS states that it "now feels that the experiment as proposed may not be the best use of resources to address the mandates of the IDCP Act." Yet it provides little rationale for this statement. It raises scientific, political, logistical, and ethical concerns.

The scientific concerns center around small sample sizes, lack of controls, and lack of comparative data from the proposed necropsy study. NMFS claims that the small sample size is a concern because of the IDCPA's focus on determining population level effects. While it is true that the IDCPA focus is on the effect on the population rather than the individual, the research program under the IDCPA is constructed such that the cumulative analyses of all of the various research programs mandated under the Act should provide NMFS with the ability to determine the effect of stress at a population level. The authors of the legislation were well aware that the chase-recapture study, by itself could not yield population level data, but could contribute significantly to evaluating the physiological dynamics of individuals, that together with the other data could be extrapolated to the population as a whole.

NMFS also raised the concern about the lack of control for the chase-recapture study. Workshop participants acknowledge the fact that there is a "lack of a satisfactory control group for comparison of potentially stressed and non-stressed individuals."[6] Participants agreed that terminal sampling of individuals during different stages of a repeated chase and capture study would provide controls for making definite conclusion regarding the effects of the purse seine operations.[7]

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[6] Curry, B.E. and E.F. Edwards. 1998 Investigation of the potential influence of fishery-induced stress on dolphin in the eastern tropical Pacific Ocean: Research Planning. US DOC NOAA Technical Memorandum NMFS, NOAA-TM-NMFS-SWFSC-254.

[7] *Id.*

CMC is deeply concerned that NMFS has already concluded in this document that the proposed necropsy program is a failure and that there is going to be insufficient data to contribute to the final Finding by the Secretary of Commerce. To the contrary, if NMFS aggressively pursued acquiring such samples and worked collaboratively with the State Department and nations that encircle dolphins, CMC is confident that sufficient necropsy samples could be gathered to allow for a meaningful analyses and a potential control for the chase-recapture study. In CMC's opinion, NMFS has not made the necropsy study a research priority, and has only half-heartedly pursued the international collaboration necessary to implement this program.

Subsequently, the problems encountered in initiating the necropsy study has caused NMFS to raise political concerns regarding whether it can obtain international cooperation, permits, and use of a purse seine vessel to conduct the chase-recapture experiment. We acknowledge that there have been significant delays and obstacles in undertaking the necropsy study, which may give NMFS cause for concern. However, NMFS learned valuable lessons that should facilitate undertaking the chase-recapture study. There is strong commitment both in the Agreement on the International Dolphin Conservation Program and in the IDCPA to conduct international cooperative research. But these programs will only be achieved through the dedicated efforts of the NMFS, the State Department, and our international partners. Recognizing that the yellowfin tuna purse seine fishery is international and is no longer dominated by the United States, NMFS is remiss in dismissing further effort to undertake cooperative research projects, especially, in this instance the chase-recapture experiment.

In the document NMFS states that the chase-recapture "experiment would be both expensive and complicated." The crafters of the International Dolphin Conservation Program Act (IDCPA) were well aware of the obstacles associated with undertaking this experiment, having the benefit of results gathered during similar experiments conducted in the late 1970s and early 1980s. Furthermore, both the authors of the legislation and the organizations that supported and accepted the compromise reflected in the IDCPA's research program were aware that the chase-recapture experiment called for intentional stressing of dolphins and invasive collection techniques. Ethical considerations aside, all parties agreed that meaningful physiological data could only be gathered through this process, data that could begin to answer questions, that to date, have not been answered or fully investigated.

Alternative Proposals from the Animal Welfare Institute.

CMC commends the Animal Welfare Institute's efforts to provide alternative experimental proposals. However, we concur with NMFS that AWI proposals will not provide information that can be used to answer specific physiological questions and to date have provided ambiguous results. CMC is equally concerned that, recognizing that NMFS data only extend to 1990, any analysis evaluating the potential separation of cow-calf pair will not assess recent changes in the fishery over the last decade.

NMFS Alternative Research Programs

CMC does not object to NMFS conducting alternative research projects that may further evaluate the effect and level of stress on dolphins encircled in the ETP tuna fishery. However, the studies proposed suffer many of the same scientific concerns that NMFS raised about the chase-recapture study—insufficient sample size and lack of controls. The main difference is that NMFS can control these analyses, conducting them using samples at the Southwest Science Center and researchers currently employed at the Center. CMC again raises concerns that the data set that is being used to evaluate the genetic relatedness of cows and calves lacks recent data—samples from the last decade—that would allow NMFS to evaluate trends in the fishery and possible adaptations in the dolphin populations. The molecular analyses, while promising, lack controls and quantifiable measures to evaluate or equate the molecular response to a particular level of stress. Furthermore, there is currently no means to determine whether that level of stress demonstrated in a molecular response is one that is causing systemic problems either for the individual or the population as a whole. Finally, the molecular analyses measure only a stress response and provide no information as to the animal's or population's ability to adapt. Animals that may at one time have a molecular response could lose the evidence of that response in the skin as the skin sloughs. A lack on molecular evidence could indicate either an animal that has adapted to this stressor or has never been subjected to the stressor.

CONCLUSION

While NMFS has raised several valid scientific concerns, these concerns could be remedied through consultations with experts in the field of stress physiology and further refinement of the chase-recapture experiment. The political, logistical, and ethical concerns are not grounds for violating the mandate of the IDCPA by failing to complete the required chase-recapture experiment. Nor are these concerns of sufficient gravity or so insurmountable as to alter either the law or the research plan developed by NMFS. Therefore, CMC strongly urges NMFS to conduct the chase-recapture experiment mandated by the IDCPA and seek to remedy its concerns by convening an international workshop to further refine the experimental protocols and the terms for international cooperation for this experiment.

Sincerely,

Nina M. Young

Nina M. Young
Director of Marine Wildlife Conservation